Source Water Assessment Report



Public Water Supply: FORT LEAVENWORTH

Assessment Areas Include: 866



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Reports were generated with the Automated Source Water Assessment Tool (ASWAT). Assessments were completed online using ASWAT by hundreds of state employees, public water supply staff, and technical assistant providers throughout the State of Kansas.

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Report Description

Detailed Explanation of Entire Report:

The 1996 amendments to the Safe Drinking Water Act require each state to develop a Source Water Assessment Program (SWAP) and a Source Water Assessment (SWA) for each Public Water Supply (PWS) that treats and distributes raw source water. In Kansas there are 761 public water supplies that require SWAs. A SWA includes a delineation of the source water assessment area, an inventory of potential contaminant sources, and a susceptibility analysis.

A PWS can consist of one or more individual assessment areas that require different assessments. In general, an assessment area is delineated at a two-mile fixed radius for a groundwater well. A surface water intake assessment area is the upstream-drainage area (watershed), inside the state border. Additionally, an assessment area can consist of an individual well, group of wells, an individual surface water intake, or multiple surface water intakes.

After each assessment is completed a report is automatically generated using an Internet-based application called the Automated Source Water Assessment Tool (ASWAT). The individual assessment reports combine to form the entire SWA report for a PWS.

A map of each Assessment Area was also generated with ASWAT. However, for security reasons the maps are not included in this report. To obtain a copy of the map(s), please contact your local PWS.

All PWS reports will be available for viewing and downloading on KDHE's Watershed Management Section website(http://www.kdhe.state.ks.us/nps) in 2004.

FORT LEAVENWORTH Summary:

AA	Туре	Diversion Id
866	Ground water multiple wells	008, 009, 007, 006, 005

Assessment Area: 866

Diversion Id's: **008, 009, 007, 006, 005**

Status: Accepted

Submit Date: 2002–10–03 11:02:59

Executive Summary:

The Executive Summary gives the assessment area's Susceptibility Likelihood Score (SLS) for each contaminant of concern category.

SLS indicates which contaminant category is most likely to impact a given public water supply. Contaminants of concern for groundwater include microbiological, inorganic compounds, nitrates, synthetic organic compounds, pesticides, and volatile organic compounds. Contaminants of concern for surface water include microbiological, inorganic compounds, eutrophication – phosphorus, sedimentation, synthetic organic compounds, pesticides, and volatile organic compounds.

To determine the assessment area's susceptibility to contamination, a qualitative (semi-quantitative) screening level susceptibility analysis was designed that utilizes general assumptions and best professional judgement. It is a systematic procedure comprised of simple yes/no questions. Each question in the susceptibility analysis focuses on the presence or absence of potential pollution sources in the assessment area. SLS is most useful in helping the Public Water Supply (PWS) focus on water quality protection actions towards a contaminant category of concern. For example, if the SLS for microbiological contamination is high, relative to volatile organic compounds (VOC), water supply protection planners would conclude that the attention should be directed towards microbiological contaminant sources rather than VOC sources.

Executive Summary

Public Water Supply: FORT LEAVENWORTH

Assessment Area: 866

Susceptibility Likelihood Scores for Assessment Area

Contaminant Category	A	В	B*	С	C*	D
Susceptibility Likelihood Score – SLS	32	38	32	44	36	46
SLS Range	Low	Low	Low	Low	Low	Low

A – Microbiolgical

B* – Nitrates

C* – Pesticides

B – Inorganic Compounds

C – Synthetic Organic Compounds

D – Volatile Organic Compounds

Susceptibility Likelihood Range

SLS Range	
0-50	Low Susceptibility
51-80	Moderate Susceptibility
81–100	High Susceptibility

Assessment Area: 866

Diversion Id's: 008, 009, 007, 006, 005

Status: Accepted

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Potential Sources:

The Potential Sources section lists all the sites that have been identified as potential sources of contamination.

Potential sources of contamination may include land uses, industry, or businesses that could generate or store chemicals/substances that could potentially contaminate the water supply only if released into the environment. Both unregulated sites from business location databases and regulated sites from various KDHE databases were compiled. Additional sites could have been added by an evaluator through the assessment process to supplement the original data.

The 1987 Standard Industrial Classifications (SIC) were used to identify potential contaminate sites. The SIC system classifies establishments into industries on the basis of the primary activities of the establishment.

Each assessment area is delineated with 3 assessment zones. These zones can be used to get a general understanding of the potential influence sites have based on proximity to the water supply. Zone A is a 100–foot radius around a groundwater well and a 1000–foot radius around a surface water intake. Zone B is a 2000–foot radius around wells and a hydrological delineated buffer around the surface water sources. Zone C is a 2–mile radius around wells and the balance of the watershed for intakes. The potential sources listed in this section are sorted to show all the potential sources in Zone A first, Zone B second, and Zone C third.

Although a facility or business is identified in the study as a potential concern, it does not necessarily mean a release or spill has occurred. Contamination could only occur if certain chemical substances are released into the environment and filter into the water supply source.

The data for the potential sources of contamination was compiled from May through August in 2002. Some of the databases used were incomplete datasets that are continually being updated. Due to the incompleteness, inaccuracies, and new development, it is possible that sources of potential contamination that are in the assessment area are not included in the report. Inaccurate locations could also cause sources to show up in the assessment area that are not actually in the assessment. Additionally, duplication between the datasets could cause sites to show up multiple times in the assessment area.

Potential Sources

Public Water Supply: FORT LEAVENWORTH

Assessment Area: 866

Unregulated Potential Site Sources

Source No.	SIC Description	SIC ID	Zone
101846	Single–family Housing Construction	1521	С
101847	Single–family Housing Construction	1521	С
101859	Single–family Housing Construction	1521	С

Regulated Confined Animal Feeding Operations Potential Site Sources

Did Not Contain Any Of These Potential Site Sources

Regulated Hazardous Waste Potential Site Sources

Did Not Contain Any Of These Potential Site Sources

Regulated Leaking Storage Tank Potential Site Sources

Did Not Contain Any Of These Potential Site Sources

Regulated Identified Contaminated Potential Site Sources

Source No.	Source Name	ID/Permit No.	Zone
7000589	FT LEAVENWORTH	C405270004	С
7000591	MIDWEST RELAY/RADIO TRANSMITTER (FORMER)	C405271254	С
7000950	FT LEAVENWORTH – FTL–12 – USED OIL TANK, BLDG 305	C405271497	С
7000951	FT LEAVENWORTH – FTL–13 – USED OIL TANK, BLDG 689	C405271498	С
7000952	FT LEAVENWORTH – FTL–20 – SEPTIC TANK, USDB GRNHSE	C405271505	С
7000953	FT LEAVENWORTH – FTL–21 – SEPTIC TANK, BLDG 428	C405271506	С
7000954	FT LEAVENWORTH – FTL–22 – SEPTIC TANK, BLDG 425	C405271507	C
7000955	FT LEAVENWORTH – FTL–35 – WASH RACK, BLDG 571	C405271520	С
7000956	FT LEAVENWORTH – FTL–38 – WASH RACK, RECYC CTR,305	C405271523	С
7000957	FT LEAVENWORTH – FTL–44 – INCINERATOR, BLDG 632	C405271529	С
7000958	FT LEAVENWORTH – FTL–45 – INCINERATOR, BLDG 136	C405271530	С

Regulated Identified Contaminated Potential Site Sources

Source No.	Source Name	ID/Permit No.	Zone
7000959	FT LEAVENWORTH – FTL–48 – SEWAGE TRTMT SYSTEM, 138	C405271533	C
7000960	FT LEAVENWORTH – FTL–52 – USED OIL TANK, BLDG 109	C405271537	С
7000961	FT LEAVENWORTH – FTL–53 – USED OIL TANK, USDB	C405271538	C
7000962	FT LEAVENWORTH – FTL–56 – FLYING CLUB USED OILAREA	C405271541	C
7000963	FT LEAVENWORTH – FTL–60 – STRIPPING AREA, S GRNHSE	C405271545	С
7000964	FT LEAVENWORTH – FTL–62 – UNDERGROUND PROPANE TANK	C405271547	С
7000965	FT LEAVENWORTH – FTL–64 – USED TANK, BLDG 264	C405271549	С
7000966	FT LEAVENWORTH – FTL–26 – PAST PESTICIDE,BLDG 234A	C405271511	С
7000967	FT LEAVENWORTH – FTL–67 – UNDERGRD STOR TANKS, 350	C405271552	С
7000968	FT LEAVENWORTH – FTL–68 – WEED CONTROL, CITY OF LV	C405271553	С
7000969	FT LEAVENWORTH – FTL–70 – FUEL OIL LEAK, USDB	C405271555	С

Regulated Solid Waste Potential Site Sources

Source No.	Source Name	ID/Permit No.	Zone
5000369	Ft. Leavenworth	0362-S	С

Regulated Waste Water Potential Site Sources

Source No.	Source Name	ID/Permit No.	Zone
6000057	DEPT. ARMY-FT. LEAVENWORTH	F-MO12-PO04	С

Assessment Area: **866**

Diversion Id's: **008, 009, 007, 006, 005**

Status: Accepted

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Added Sources:

The Added Sources section lists all the sites that have been added as potential sources of contamination by an evaluator through the assessment process to supplement the original data.

The potential sources listed in this section are sorted to show the added potential sources in Zone A first, Zone B second, and Zone C third.

Although a facility or business was added as a potential concern, it does not necessarily mean a release or spill has occurred. Contamination could only occur if certain chemical substances are released into the environment and filter into the water supply source.

Added Sources

Public Water Supply: FORT LEAVENWORTH

Assessment Area: 866

Added Potential Site Sources

Source No.	Source Name		Zone
Did Not Add Any Site Sources			

Assessment Area: **866**

Diversion Id's: **008, 009, 007, 006, 005**

Status: Accepted

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Potential Contaminants Summary:

The Contaminants Summary shows the number of identified unregulated sources in the assessment area for each contaminant of concern category.

In order to obtain the number or sources for each category, a relationship was correlated between each Standard Industrial Classification (SIC) and the contaminant of concern categories. Each SIC was assessed and associated with contaminant categories. For example, if not managed properly, a car wash (SIC 7542) could potentially contaminate an intake because of inorganic compounds (IOC) and volatile organic compounds (VOC); thus, a car wash is associated with IOCs and VOCs.

A chart displays a count for each contaminant category. The sum for each category represents the total number of identified sources that have been associated with that particular contaminant category. However, the total number of identified sources does not include contaminants from the Added Sources. In our example, a car wash would be considered 2 sources of contamination. It would be a potential source of contamination for IOCs and for VOCs; thus, 1 would be added to the total number of sources in the VOC category and 1 would be added to the IOC category.

Potential Contaminants Summary

Public Water Supply: FORT LEAVENWORTH

Assessment Area: 866

Number of Unregulated Site Sources Identified for each Contaminant Category

MicroBiological	Pesticides	IOC's	SOC's	VOC's	Nitrates
3	0	0	3	0	3

A – Microbiolgical

B* – Nitrates

C* - Pesticides

B – Inorganic Compounds

C – Synthetic Organic Compounds

D – Volatile Organic Compounds

Assessment Area: 866

Diversion Id's: 008, 009, 007, 006, 005

Status: Accepted

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Potential Contaminants Listing:

The Potential Contaminants section lists the contaminant of concern category associated with each Standard Industrial Classification (SIC) found in an assessment area. A complete list of contaminant category codes are located at the bottom of this page.

The relationships defined between the Standard Industrial Classifications (SIC) and the contaminant of concern categories are displayed in a table format. Using our car wash example, the relationships can be better illustrated. A car wash could release IOC and VOC chemical substances. The connection is shown by indicating the SIC, 7542, and the associated contaminant categories, IOC (Category B) and VOC (Category D). However, the contaminants listed are not associated with any Added Sources.

The list is sorted by the SIC source description and it only shows unique SIC sources. For example, an assessment area can have 20 car washes in an assessment area, but the list is only going to show contaminant categories associated with car washes onetime. This is because all car washes have the same SIC and every car wash poses the same potential threat to water intakes.

A – Microbiolgical B – Inorganic Compounds
 B2 – Sedimentation B* – Nitrates
 B1 – Eutrophication – Phosphorous
 C – Synthetic Organic Compounds

C* – Pesticides **D** – Volatile Organic Compounds

Potential Contaminants Listing

Public Water Supply: FORT LEAVENWORTH

Assessment Area: 866

Unregulated Identified Site Sources and associated Potential Contaminant Category

SIC ID	SIC Source	Potential Contaminant	Contaminant Category
1521	Single-family Housing Construction	Oil, Paint, Pesticides, Fertilizers	A
"	п	ıı	B1
"	"	"	B2
"	"	"	B*
"	"	"	С

Assessment Area: **866**

Diversion Id's: **008, 009, 007, 006, 005**

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Protection Measures:

The Protection Measures section shows water quality protection measures for the Standard Industrial Classifications (SIC) identified in the assessment area.

Previous sections of this report are designed to show areas that Public Water Supplies (PWS) can focus on to improve the susceptibility of an assessment area. This section helps identify water quality protection measures that a PWS can use as guidance for implementing action for a potential contaminant site in the assessment area. It focuses on protection measures that can reduce the risk of contamination to the water supply.

This portion of the report only displays water quality protection measures for each type of SIC found in the assessment area. It does not display protection measures for each site in the assessment area because every SIC should have the same or similar water quality protection management practices. However, the protection measures listed are not associated with any Added Sources.

Protection Measures

Public Water Supply: FORT LEAVENWORTH

Assessment Area: 866

Recommended Water Quality Protection Measures

SIC	SIC Source	Contaminant Source	Water Quality Protection Measure	Regulatory Authority
1521	Single–family Housing Construction	Oil, Paint, Pesticides, Fertilizers	IProper storage application	KAR 28–48, KDHE, KDEM

Assessment Area: **866**

Diversion Id's: **008, 009, 007, 006, 005**

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Assessment Analysis:

The Assessment Analysis section displays the numbers assigned to each contaminant of concern category for each question in the susceptibility analysis.

This analysis is based on a decision tree framework consisting of a series of yes/no questions. These questions consider the proximity of contaminant sources to the water supply intake, the type of contaminant, and the application of pollution prevention or water quality protection practices to sources of contamination. As the evaluator moves through the analytical framework, susceptibility points are accumulated based on the presence of contaminant sources in the assessment area.

After all the questions have been answered, the SLS is calculated for each contaminant of concern category. The SLS is determined by counting the number of contamination risk factors found to occur in the delineated assessment area and applying a multiplier to this number. Because the number of contaminant category risk factors is not equal, the multiplier is used to establish a common scale for the SLS of each contaminant category.

Assessment Analysis

Public Water Supply: FORT LEAVENWORTH

Assessment Area: 866

Ground Water Multiple Wells Analysis

 ${\bf A}$ – Microbiolgical ${\bf B}$ – Inorganic Compounds

B* – Nitrates
 C – Synthetic Organic Compounds
 C* – Pesticides
 D – Volatile Organic Compounds

No.	Question		A	В	B *	C	C *	D
1	Is any well under the influence of surface water?			0	0	0	0	0
2	Do all PWS wells meet KS PWS water well construction standards?	Yes	0	0	0	0	0	0
3	Is any well less than 30 feet deep?	No	0	0	0	0	0	0
4	Is gravel pack within 20 feet of any well surface?	Yes	1	1	1	1	1	1
5	Does a PWS own or control all the areas around the wells?		0	0	0	0	0	0
6	Does Zone B consist entirely of native grass?			2	2	2	2	2
7	Is there a contaminated well in Zone B?	No	0	0	0	0	0	0
8	Is a class V UIC well present?	No	0	0	0	0	0	0
9	Are any commercial, industrial, or urban areas present in Zone B?	Yes	1	1	1	1	1	1
10	Does each industrial/commercial site and urban area have a water quality protection plan in place?	No	1	1	1	1	1	1
11	Are any non-farm home sites present in Zone B?	No	0	0	0	0	0	0
12	Do all the non-farm home sites have a water quality protection plan?	Yes	0	0	0	0	0	0
13	Are any farmsteads present in Zone B?	No	0	0	0	0	0	0
14	Do all farmsteads have a water quality protection plan?		0	0	0	0	0	0
15	Is there grazing livestock in Zone B?		0	0	0	0	0	0
16	Have all livestock producers implemented water quality protection measures?	Yes	0	0	0	0	0	0
17	Is there livestock confinement in Zone B?	No	0	0	0	0	0	0

No.	Question	Response	A	В	B *	C	C*	D
18	Is each confined animal feeding operation registered with KDHE?	Yes	0	0	0	0	0	0
19	Is there corn or grain sorghum production in Zone B?	No	0	0	0	0	0	0
20	Are corn/grain sorghum nutrient and pesticide management plans in use for each site?	Yes	0	0	0	0	0	0
21	Are any orchards present in Zone B?	No	0	0	0	0	0	0
22	Are orchard nutrient and pesticide management plans in use for each site?	Yes	0	0	0	0	0	0
23	Are there unsewered developments (concentrations of lagoons or septic systems) present in Zone B?			0	0	0	0	0
24	Is there a railroad or major highway in Zone B or C?	Yes	0	1	1	1	1	1
25	Is there oil production in Zone B or C?	No	0	0	0	0	0	0
26	Do coarse textured soils predominate Zones A, B and C?	No	0	0	0	0	0	0
27	Is an irrigation well located in Zone B or C?	No	0	0	0	0	0	0
28	Is a wastewater treatment facility in Zone B or C?	No	0	0	0	0	0	0
29	Is a solid waste landfill in Zone B or C?	Yes	1	1	1	1	1	1
30	Are there unplugged, abandoned water wells present in Zone C?	No	0	0	0	0	0	0
31	Are any commercial, industrial, or urban area present in Zone C?	Yes	1	1	1	1	1	1
32	Does each industrial/commercial site and urban area have a water quality protection plan in place?	No	1	1	1	1	1	1
33	Is there livestock confinement in Zone C?	No	0	0	0	0	0	0
34	Is each confined livestock facility registered with KDHE?	Yes	0	0	0	0	0	0
35	Do all the livestock producers have water quality protection measures in place?	Yes	0	0	0	0	0	0
36	Are cropland nutrient management plans in place?	No	0	0	1	0	0	0
37	Are cropland pesticide management plans in place?	No	0	0	0	0	1	0
38	Does a perennial stream flow into Zone C?	Yes	1	1	1	1	1	1
39	Are watershed water quality protection plans in place?	No	1	1	1	1	1	1

Assessment Area: **866**

Diversion Id's: **008, 009, 007, 006, 005**

Status: Accepted

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Site Comments:

The Site Comments section lists all the comments that were added for the potential sources of contamination found in the assessment area.

Local comments and feedback from people that are familiar with the assessment area is an important aspect of the assessment. The comments greatly improve the assessment by adding detail to the sites that can be referenced for more information.

This local information may include comments on potential contamination threats (or lack there of), local water quality protection initiatives, etc. Adding comments are optional and are mainly focused on sources in areas that could have the greatest impact on water supply if a spill or release occurred in the environment. It is left to the discretion of the PWS and/or source water assessment committee to add comments.

Site Comments

Public Water Supply: **FORT LEAVENWORTH**

	Did Not Receive Any Comments
Comments for Re	gulated Confined Animal Feeding Operations Sites
	Did Not Receive Any Comments
Comments for Re	gulated Hazardous Waste Sites
Comments for Re	Did Not Receive Any Comments
Comments for Re	egulated Leaking Storage Tank Sites Did Not Receive Any Comments
Comments for Re	gulated Leaking Storage Tank Sites
	gulated Leaking Storage Tank Sites
	egulated Leaking Storage Tank Sites Did Not Receive Any Comments
Comments for Re	Did Not Receive Any Comments Equilated Identified Contaminated Sites Did Not Receive Any Comments
Comments for Re	gulated Leaking Storage Tank Sites Did Not Receive Any Comments gulated Identified Contaminated Sites

Comments for Regulated Waste Water Sites

Did Not Receive Any Comments

Assessment Area: **866**

Diversion Id's: **008, 009, 007, 006, 005**

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Added Site Comments:

The Added Site Comments section lists the comments for why sites were added as a potential source of contamination found to the assessment area.

Added Site Comments

Public Water Supply: FORT LEAVENWORTH

Assessment Area: 866

Comments for Added Contaminant Sites

Added Contaminant Site Name	Site No.	Site Comments	Author			
Did Not Receive Any Comments						

Assessment Area: **866**

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Status: **Accepted**

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Analysis Question Comments:

The Analysis Question Comments section lists all the comments that were added during analysis portion of the assessment, in which a series of yes/no questions were asked.

Evaluators have the option to add comments to questions to clarify why a response was given or to give more details to a question. Local comments and feedback from people that are familiar with the assessment area is an important aspect of the assessment. The comments greatly improve the assessment by adding clarification and details that could not be identified with a simple yes or no response.

Analysis Question Comments

Public Water Supply: FORT LEAVENWORTH

Assessment Area: 866

Comments for Analysis Questions

Analysis Question	Question Comments	Author	
Does a PWS own or control all the areas around the wells?	PWS is located on a U.S. Army Installation owned by U.S. Government	Ron Guenther	
Does Zone B consist entirely of native grass?	There is a U.S. Army airfield located in the zone	Ron Guenther	
Are any commercial, industrial, or urban areas present in Zone B?	There is a U.S. Army airfield located in the zone	Ron Guenther	
Is there a railroad or major highway in Zone B or C?	There is a Missouri Pacific Railroad line running north and south through the installation	Ron Guenther	
Does each industrial/commercial site and urban area have a water quality protection plan in place?	Unknown	Ron Guenther	
Are watershed water quality protection plans in place?	Unknown	Ron Guenther	
Are cropland nutrient management plans in place?	No croplands located on Fort Leavenworth	Ron Guenther	
Are cropland pesticide management plans in place?	No croplands located on Fort Leavenworth	Ron Guenther	